Perspective of MBBS students of a government medical college on various aspects of online medical education: A cross-sectional questionnaire-based survey

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ABSTRACT

Background: The COVID-19 pandemic and its accompanying lockdown measures adversely affected institution-based education system including medical education. Internet-based online teaching emerged as the only alternative mode of continuing medical education during those times. The situation was novel to the medical institutions, the faculties, as well as the students and involved coordinated effort from all stakeholders for an efficient outcome to the ritual of compulsory online medical education. **Aims and Objectives:** The study was planned to obtain the perspective and point of view to various aspects of online teaching from of the MBBS students. **Materials and Methods:** A cross-sectional online survey was conducted through a questionnaire using Google-Forms on MBBS students of Raiganj Government Medical College, Raiganj, from August 1, 2022 for a period of 1 week after obtaining necessary ethical clearance. **Results**: A total of 174 students responded out of 202. Majority of the respondents (81.3%) said that it was their first experience of online teaching. Most attended 2–3 h of online classes daily and did not want it to be more than that either. Somnolence during class was cited as the most common physical difficulty, while poor network connectivity was the biggest logistic problem. Live lecture was the most preferred mode of online teaching and personal email interaction with the concerned faculties was the most preferred mode for doubt clearing. Most students found online classes inferior than offline classes with respect to opportunity to interact with teachers, class ambience, ability to sustain attention, demonstration of practical skills, and peer-interaction. **Conclusion:** Online medical education, in spite of all its present drawbacks and demerits, can be used as a tool to provide medical education alongside offline mode after making necessary innovations and modifications by analyzing student as well as faculty feedback.

Key words: Online medical education; Pedagogical shift; MBBS student

INTRODUCTION

The novel coronavirus pandemic (COVID-19) and its accompanying norms pertaining to "social distancing" and "comprehensive lockdowns" greatly affected the way medical education had to be imparted to medical students worldwide.[1] Conventional techniques used in medical education in the pre-pandemic era almost exclusively required one-on-one or group interactions between facilitators and students with very little emphasis on remote interactive learning using the internet, especially in developing third-world nations on account of infrastructural limitations, lack of relevant expertise, and overall low feasibility in a background of obvious economic

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constraint.[2-5] The COVID-19 pandemic, however, changed the entire scenario with remote e-learning emerging as the only plausible way for providing medical education, especially to the undergraduate medical students.[6]

At the outset of the pandemic, as the situation was unprecedented and occurred relatively abruptly the preparedness for providing medical education by the online route was obviously rudimentary in most medical teaching institutions in India.[7] However, with the situation persisting for a prolonged period, all medical colleges had to adopt and implement methods for imparting medical education by the online route. The modalities adopted evolved over time and kept evolving as long as restrictions accompanying the pandemic were in place. In this context, the present study was planned to obtain the perspective of the students of a medical teaching institution on different aspects of e-learning and online teaching methods, in which they had received during the pandemic-induced restriction period through a pre-structured questionnaire.

Aims and objectives

The primary objective of the study was to obtain the perspective and point-of-view of the students about different aspects of online teaching that they received during the pandemic period. Also, by deliberating on their responses, the lacunae that occurred during the delivery of online teaching were planned to be identified so that they can be amended if similar situation arises in the future.

MATERIALS AND METHODS

The study was conducted through an online survey, whereby MBBS students of Raiganj Government Medical College were provided with a structured questionnaire through Google Forms to their individual email accounts and their responses were recorded and analyzed. By design, the study was cross-sectional in nature. The questionnaire was "Face Validated" by relevant experts in the field of medical education affiliated to other medical colleges. The Institutional Ethics Committee clearance was obtained before commencement of the study.

Inclusion criteria

All MBBS students admitted at Raiganj Government Medical College during the academic sessions 2019–2020 and 2020–2021 were considered eligible to respond to the questionnaire as all of them have received a substantial amount of their medical education during the pandemic period by online mode.

Exclusion criteria

No specific exclusion criteria were prescribed, but those students who failed to respond to the questionnaire within the stipulated time frame, for which the Google Form was kept active, were automatically excluded from the survey.

The questionnaire containing a disclaimer and 20 questions (comprising a mixture of closed questions with dichotomous or multiple options, open questions with closed options, and semi-open questions) was made into a Google Form and, then, sent to the individual email accounts of each MBBS student on August 1, 2022. They were given a time period of 1 week to send in their replies. The Google Form was designed in such a way that each student can submit only one completed response and no question can be left unanswered. Out of a total of 202 MBBS students (100 from 2019 to 20 MBBS batch and 102 from 2020 to 21 MBBS batch) who were sent the questionnaire, 174 students sent back their replies within the stipulated time frame. Sampling technique, thus, employed is that of a convenient sample.

The obtained data were automatically analyzed by Google Forms itself. For better analysis of composite parameters, a data sheet was created using Microsoft Excel. Categorical data have been presented as percentages. Few questions of the questionnaire were statements, the responses to which were graded into five-point Likert scale with "strong agreement" being ascribed five points and "strong disagreement" one point. The "mean score±1 SD" for each such question was computed using Microsoft Excel. The overall response to a statement was taken to be that of an "agreement" if the mean score was >3. A mean score of ≤3 was taken to be "disagreement" to the said statement.

RESULTS

The questionnaire had no "identifier" part so that the respondents could remain anonymous. Total number of responders were 174 (n=174). In terms of demographic distribution, majority of the respondents to the study (104 out of 174; 59.8%) attended the online classes from urban areas, while the rest did so from a rural setting. For an overwhelming majority of the respondents (148, 81.3%), this was the 1st time that they encountered online-teaching during their entire studentship (Table 1; Sl. No. 1 and 2).

Among the respondents, a major fraction (102 of 174; 58.6%) said that they attended 2–3 h of online classes per day during the lockdown phase, while another significant fraction (51 of 174; 29.3%) said that they did so for 3–4 h per day. When queried about the ideal number of hours that should be allocated for all online classes per day, a huge majority of the students (152, 87.4%) said that it should not be >4 h per day and half among them (76, 43.7%) felt that it should not be >3 h per day (Table 1; Sl. No. 3 and 4).

Table 1: Responses of students to question 1-7 of the questionnaire

S. No.	Question	Options	Responses (%)
1	What is the location of the place from where you attended most of your online classes?	Urban (City/Big town) Rural (Small town/Village)	104 (59.8) 70 (40.2)
2	Is this the first experience of online classes in your studentship?	Yes No	142 (81.6) 32 (18.4)
3	On an average for how many hours have you attended online classes per day during lockdown period?	<1 h 1–2 h 2–3 h 3–4 h >4 h	0 17 (9.8) 102 (58.6) 51 (29.3) 4 (2.3)
4	Maximum total duration of all online classes per day should be	< 2 h 2–3 h 3–4 h 4–5 h > 5 h	9 (5.2) 67 (38.5) 76 (43.7) 18 (10.3) 4 (2.3)
5	What mode of online class do you prefer?	Live online lecture/demonstration classes Pre-recorded class videos Live small group discussion Webinars/Large group discussion with multiple faculties	82 (47.1) 62 (35.6) 17 (9.8) 13 (7.5)
6	What do you feel is the best method for doubt clearing during online classes?	During the class (direct questioning by microphone/typing in chat box) During special doubt clearing session immediately post-class. Using personalized messaging services such as – Email and WhatsApp for interacting with facilitators. Airing the doubts in common platform like – in Google class room or WhatsApp groups	35 (20.1) 33 (18.9) 86 (49.4) 20 (11.6)
7	What method can be used to ensure continued attentiveness of a student during online class?	Keeping the camera on all the time Using specialized software to keep track of attendance Formal roll call at the end of class Surprise roll call during the class	16 (9.2) 48 (27.6) 19 (10.9) 91 (52.3)

The respondents were asked to identify the most common physical and logistic difficulty that they faced while undergoing online classes and the questions were framed in a semi-open manner with freedom being provided to the respondents to report any other relevant option other than those provided. The responses obtained are depicted in Figures 1 and 2.

In response to the question on most common physical difficulty that the students faced during online classes, 36% opted for "somnolence due to loss of interest," 28% cited "boredom due to absence of peers," 28% marked "eye-strain/headache due to prolonged screen time," and 7% gave "backache due to prolonged sitting" as their answers.

In response to the question on logistic difficulty faced during online classes, majority of the students (94 out of 174, 54%) cited disturbance in network connectivity as their most common problem. Time and data-pack limitation issues were marked as the next most common difficulty, obtaining 31% of the responses. Other issues such as technical software or hardware problems were much less cited, accounting for only 14% of the responses together.

Out of the 94 students who opted for network connectivity disturbance as their logistic problem, 62 (66%) hailed from rural areas and 32 (34%) from urban dwellings. The total
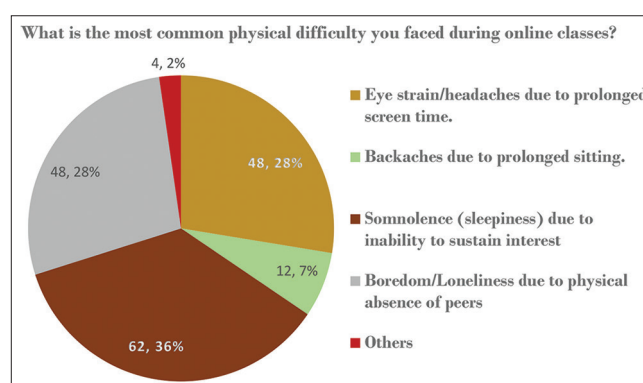

Figure 1: Pie-diagram showing distribution of physical difficulties faced by students

number of respondents from rural background was 70 and from urban areas were 104. Hence, a much higher percentage of rural students (62 out of 70, 88.5%) faced network problem in comparison to students hailing from urban areas (32 out of 104, 30.7%).

The most preferred mode of online class for the respondents in the survey was "live online lectures" (82 out of 174), while "pre-recorded class videos" was their choice of second preference. The other options such as "Webinars" and "Group discussions with multiple faculties" were much less preferred by the students (Table 1; Sl. No. 5). For "doubt clearing" through online mode, almost

half of the responding students (86 out of 174, 49.2%) preferred "personal interaction through Email/WhatsApp with the concerned facilitator" as their choice (Table 1; Sl. No. 6). As sustaining attention during online lectures was presumed to be difficult, the students were asked about their opinion about the best way to maintain attentiveness. From among the options given, "surprise roll-call during the class" was chosen as the answer by 52% of the students (Table 1; Sl. No. 7).

The last 11 questions of the questionnaire were statements to which the students were asked to give their response on a five-point Likert scale ranging from "strong agreement" to "strong disagreement." The results are depicted in Table 2.

The respondents in the study "disagreed" to the notion that there was sufficient opportunity to interact with the

teachers during online classes. They also "disagreed" to the notions that "online" classes are at par with "offline" classes in terms of sustaining attention during the class or for demonstration of practical procedures. Although the students were presumed to be attending the online classes from their residences, their collective response was that of "disagreement" when faced with the statement that "ambience of online classes are better" than offline classes. The students "agreed" to the statement that feedback opportunities were same both for offline and online classes. They also were in "agreement" to the notions that "scheduling flexibility was an advantageous feature of online teaching" and "taking class notes is convenient in online mode" than during offline classes. In terms of opportunity for peer-interaction, the respondents found it to be inadequate in online teaching. Despite the several disagreements, the students" overall experience of online teaching was satisfactory and they "agreed" to the notion that online classes should continue side by side with offline classes even in the post-COVID era. The highest mean-score, that is, the most unanimous agreement, was obtained to the notion that "online classes provide the advantage of attending classes of faculties from different medical colleges."

DISCUSSION

The COVID-19 pandemic presented a unique challenge to medical educators worldwide, whereby traditional "offline" teaching needed to be abandoned almost overnight and the entire burden of delivering medical education fell on
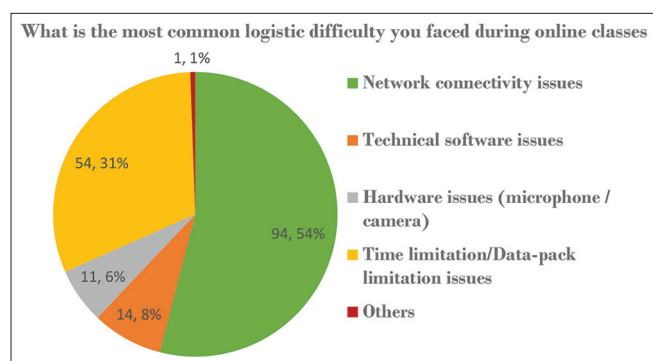

Figure 2: Pie-diagram showing distribution of logistic difficulties faced by students

Table 2: Responses of students to question 10-20 of the questionnaire							
Q. No.	Question	Responses (n=174)					Mean score±SD
		Strongly agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly disagree (1)	
10.	There are sufficient opportunities to interact with the teachers during online class	7	42	62	34	29	2.79±1.1
11.	Ability to remain attentive during online class is same as in offline class	0	16	30	62	66	1.98±0.9
12.	Demonstration of Practical classes in online platform is as good as offline classes	2	10	10	60	92	1.68±0.9
13.	Ambience of online classes are better	4	24	50	68	28	2.47±1
14.	Option for feedback at end of each class is present alike offline classes	6	67	55	36	10	3.13±0.97
15.	Flexibility of scheduling classes in online mode is an advantage	18	87	46	15	8	3.53±0.95
16.	Taking class notes are convenient in online class	8	62	42	47	15	3.01±1.1
17.	There are adequate chances to interact with fellow students at the end of online class	0	32	48	65	29	2.48±0.98
18.	Online classes should continue side by side with offline classes	14	70	40	40	10	3.22±1.1
19.	Overall experience with online method of teaching is satisfactory	6	58	50	52	8	3.01±0.97
20.	Opportunity that online mode provides to attend classes of faculties from different medical colleges is advantageous	41	94	30	6	3	3.94±0.8

online internet-based methods.[8] Almost simultaneous to this situation, the Indian medical education delivery system was trying to evolve from its age-old "sage-on-stage" image to a more student-friendly "guide-by-side" avatar by incorporating various e-learning techniques[9] in its competency-based medical education curriculum, which was adopted from the 2019-2020 session.[2] The pandemic situation caused this implementation process to become untowardly skewed toward the purely online methods of teaching at a very nascent stage and put the institutions, its faculties, as well as its students in a situation, for which they were assumed to be mostly unprepared logistically.[10] In terms of prior exposure to online teaching-learning techniques, majority of the respondents to the survey (81.6%) gave a positive response to the notion that this was the 1st time that they experienced online teaching during their entire studentship. This indicates that before the COVID pandemic, e-learning and other online teaching-learning techniques were very rarely used even in the secondary or higher-secondary level education in our country and not only in medical institutions. Ansari A, in her report, also portrayed a similar situation prevailing in most educational institutions in our country.[11]

Most of the study respondents (87.9%) attended <4 h of online classes daily with the bulk of them (58.6%) attending <3 h/day. Furthermore, majority of the respondents (82.2%) wanted maximum duration of all online classes per day not to exceed 4 h. Mukherjee et al., in their questionnaire-based study, had observed that the medical students who responded to their study attended only 2 h of online classes per day on an average.[12] Rafi et al., reported that the participants in their study preferred each online class duration not to exceed 45 min, although they did not comment on the students' preference about the ideal total duration of online classes per day.[10] Such feedback from the students is deemed to be quite intriguing since in conventional offline teaching minimum 7–8 h per day of classes is a norm, while the students' feedback on acceptable total duration of online classes per day is much less. Hence, if need again arises in the future to shift to purely online teaching, such factors should be given due consideration while formulating online class routines to maintain a balance between curriculum delivery and student preferences.

In terms of physical difficulty faced during online classes, the respondents cited the "more-mental" of the difficulties envisioned by the investigators, namely, sleepiness and boredom, much more avidly (36% and 28%, respectively) than the "more-physical" ones like headache and backache (28% and 7%, respectively). Mukherjee et al., had reported a much higher fraction of their study participants (67%) reporting "eye-strain and headache" following online classes.[12] In contrast, Rafi et al., reported a meager 1.2% of their study population citing "eye-strain" as a difficulty during online classes.[10] The physical difficulties, being subjective interpretations of the study respondents, tend to vary widely among study groups in terms of reporting, but it is quite evident that they do exist and steps to minimize them while conducting online teaching is obviously needed.

Network connectivity issue was the most common logistic difficulty faced by the study respondents. Poor network connectivity was much more of an issue for respondents attending the online classes from rural areas compared to those from urban areas, which once again reiterates the rural-urban divide that sadly still exist in our society. Hardware or software difficulties were reported very sparingly by the respondents, which highlights the superiority in terms of technical know-how the younger generation inherently seems to possess. Only one of the 174 responding students reported not facing any logistic problems at all. The fact that only one student faced no logistic difficulty points toward the overall infrastructural unpreparedness that medical education delivery machinery encountered during the pandemic times to effectively deliver medical education by the online route.

"Live online lectures" emerged as the most preferred mode of online class among the study respondents but were closely followed by pre-recorded videos. The preference exhibited by the students toward "synchronous" mode of learning (live classes) over "asynchronous" mode (pre-recorded videos) might be due to the fact that the former mode is considered superior over the latter for establishing proper teacher-learner communication and relationship,[13] even though the latter mode has the advantage of being revisited multiple times if desired by the student. Although the students preferred live online lectures, for doubt clearing, they preferred personal interaction with the facilitators through Email or WhatsApp messaging after the class rather than directly questioning during the class. Majority of the respondents cited "surprise roll-call during a class" as the most effective way to sustain attention during online classes. Surprisingly, the most conventional technique believed to be able to sustain attention, namely, "keeping the students' camera on during the class' was chosen as an option by only 9% of the students.

Online classes were felt to be an insufficient tool by the respondents for providing proper interaction opportunities with the teachers during the class. They also deemed it to be inferior in comparison to offline class for sustaining attention as well as demonstration of practical procedures. Although adopting various e-learning techniques and simulation software for practical procedures is considered the way forward in medical education,[14] yet the overall

view of the study respondents on this context seems to be that online mode cannot replace the first-hand experience that medical students gain by physically attending classes. Hammond et al., in their report, also pointed toward a similar notion.[15] Other aspects of online teaching to which majority of the study participants gave a "thumbs-down" response were class-ambience and opportunity for peer-interaction.

The aspects of online teaching that were deemed to be better than offline classes by most of the study respondents were feedback opportunities following a class, flexibility in class scheduling and convenience of taking class notes. Hodgson and Hagan, in their report, mentioned that the enhanced feedback opportunities and flexibility of class scheduling of online classes had a positive impact on their study group of students.[16] Despite the several disadvantages that the students faced during online classes, their overall reaction to the whole process was found to be "satisfactory" and majority of them felt online classes should continue vis-à-vis offline classes even in the post-COVID era. Similar findings have been reported by Gupta et al., in their study.[17] The scope of attending classes of faculties from other medical colleges that the online mode provides was given an almost unanimous positive response by the study participants, in which the investigators feel is an indication provided by the students to incorporate such exercises into online teaching modules in the future. Providing medical education could not be discontinued and so adopting and innovating the various available online tools during the pandemic as well as in the post-pandemic era is highly recommended.[18]

Limitations of the study

The study was done among MBBS students of a single medical college. Further similar studies involving students of multiple medical colleges would definitely help us to understand the students' perspectives better.

CONCLUSION

The COVID-19 pandemic forced all educational institutions including medical colleges to implement a quasi-paradigm pedagogical shift from traditional classroom teaching to internet-based online teaching within a very short-time frame. This unforeseen change in approach for providing medical education required constant monitoring, refining, and remodeling during its entire period of existence of almost about 2 years. The perspective of the recipients of this exercise, that is, the students, was obtained by the survey to get an insight into their side of the story regarding online medical education. It revealed a slight preference of the students toward short-duration live online lectures in comparison to pre-recorded Power-Point videos. Interaction with faculties for doubt clearing was preferred through personalized messaging through email or WhatsApp rather than putting up queries in common platforms like Google classrooms. Many demerits and disadvantages of online education were highlighted by the students such as network connectivity issues and somnolence and boredom during classes due to less peer interaction. However, majority of the respondents were mostly satisfied with the online education that they received, though the exact reason for their satisfaction needs to be properly investigated. The authors conclude that online medical education is here to stay but with the caveat that it cannot supplant traditional classroom-teaching but can only supplement it. To successfully implement and maintain, an online education program in the post-pandemic times not only student readiness but also wholehearted faculty involvement and analysis of their perspective needs to be done.

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